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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/523,820	03/13/2000	Michael A. Fetcenko	OBC-99	6627

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ENERGY CONVERSION DEVICES, INC.
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EXAMINER

NGUYEN, CAM N

ART UNIT PAPER NUMBER

1754

DATE MAILED: 09/25/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/523,820

Applicant(s)

Fetcenko et al.

Examiner

Cam Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE three MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 7/1/03 (an amendment/response)
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-70 and 80-100 is/are pending in the application.
- 4a) Of the above, claim(s) 56-70 and 80-89 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-55 and 90-100 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
*See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____ 6) ☐ Other:

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DETAILED ACTION

1. Applicants' remarks and amendments, filed on July 1st, 2003, have been carefully considered. Claims 1-3, 9-10, 13, 30-31, & 40 have been amended. Claims 90-100 have been amended.

Claims 1-70 & 80-100 are currently pending in this application.

Claim Rejections - 35 USC § 102(b)

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-7, 9-10, 15-17, 19-22, 27-28, 30-36, 42-44, 47-49, & 53-54 are rejected under 35 U.S.C. 102(b) as being anticipated by Mesters et al., "hereinafter Mesters", (U.S. Pat. 4,725,573).

Mesters discloses a catalyst containing metallic copper and nickel as active component carried on an inert refractory carrier, wherein the copper-nickel-alloy is present on the carrier in small metal particles with an average particle size of less than 14 nm (14 nm = 140 Å) (see col. 11, claim 1). Suitable inert refractory carriers include zirconium dioxide and titanium dioxide (see col. 2, ln 62- col. 3, ln 2). Mesters further discloses the nickel alloyed in the metallic copper

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is distributed so homogeneously, that it is present in copper-nickel particles containing at most 30% by weight of metallic nickel, based on the total weight of metallic copper and metallic nickel (see col. 3, ln 43-48).

The instantly claimed metal particulate particle size is met by the teaching of the reference since the disclosed particle size range encompasses the claimed particle size range (see Mesters at col. 11, claim 1).

The instantly claimed metal particulate content is also met by the teaching of the reference because the disclosed amount falls within the claimed range (see Mesters at col. 3, ln 43-48).

Regarding claims 27 & 53, applicants claiming the catalyst is compositionally graded within the support and the density of the particulate is graded within the support in the claims, respectively. It is considered the catalyst of the reference has the descriptions as being claimed because both Mesters and applicants' catalysts have metallic particles uniformly distributed over the surface of the support material.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in 1 section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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5. Claims 8 & 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mesters et al., "hereinafter Mesters", (U.S. Pat. 4,725,573).

Mesters discloses a catalyst as described above, except for the particles proximity.

While the reference does not indicate that the catalyst of Mesters contains the particulate having the claimed particle proximity, it is considered *prima facie obvious* to one of ordinary skill in the art that the catalytically active metals in the catalyst of Mesters would have the same particle proximity as being claimed, in view of the teaching in the reference that the catalytically active metals are uniformly distributed over the surface of a carrier material (see Mesters at col. 3, ln 43-68). Because the metallic particulates are uniformly distributed over the surface of the support, the distribution distance of the particles from one to another would be expected to be the same.

6. Claims 11-14 & 38-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mesters et al., "hereinafter Mesters", (U.S. Pat. 4,725,573), as applied to claims 1-7, 9-10, 15-17, 19-22, 27-28, 30-36, 42-44, 47-49, & 53-54 above, and further in view of Ovshinsky et al., "hereinafter Ovshinsky", (U.S. Pat. 5,840,440).

Mesters discloses a catalyst as discussed above, except for the following differences.

Regarding claims 11-13 & 38-40, Mesters does not disclose a catalyst containing nickel alloy comprising the instantly claimed metals. It would have been *prima facie obvious* to one of ordinary skill in the art at the time the invention was made to utilize a known TiNi type alloy

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containing modifier elements which may be selected from the group consisting of Ni, Cr, Co, Mn, Mo, Nb, Fe, Al, Mg, Cu, Sn, Ag, Zn, Pd, and mixtures or alloys thereof as taught by Ovshinky (see Ovshinky at col. 6, ln 43-48) to make a useful catalyst in view of the advantage that the hydrogen storage materials produced by using this TiNi type alloy containing these modifier elements comprising the crystallite size of less than about 200 Angstroms and more particularly less than about 100 Angstroms (see Ovshinsky at col. 6, ln 1-4), which applicants desired. Note that the claimed elements (Co, Mn, Fe, Al, Ti, and Sn) are met by the teaching of the reference because they fall within the listing of suitable modifier elements of the reference.

Regarding claims 14 & 41, Ovshinky does not indicate that his nickel alloy having an fcc (face-center-cubic) crystal orientation. It is considered the nickel alloy of Ovshinsky would possess the same fcc crystal orientation since both Ovshinky and applicants' nickel alloys are the same, in view of the same elements disclosed.

7. Claims 18, 24, 45, & 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mesters et al., "hereinafter Mesters", (U.S Pat. 4,725,573), as applied to claims 1-7, 9-10, 15-17, 19-22, 27-28, 30-36, 42-44, 47-49, & 53-54 above, and in further view of Flytani-Stephanopoulos et al., "hereinafter Flytani-Stephanopoulos", (U.S Pat. 4,729,889).

Mesters discloses a catalyst as discussed above, except for the instantly claimed microcrystalline metal oxide support, and a support containing manganese oxide.

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It would have been *prima facie obvious* to one of ordinary skill in the art at the time the invention was made to have utilized the instantly claimed support materials in order to obtain a catalyst having high H₂S removal efficiency and better sorbent stability catalyst in Mesters, because they are known as useful catalyst supports as shown by Flytani-Stephanopoulos (see Flytani-Stephanopoulos at col 22, claim 7; col 4, ln 19-21; & col 4, ln 67- col 5, ln 3).

8. Claims 23, 26, 50, & 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mesters et al., "hereinafter Mesters", (U.S Pat. 4,725,573), as applied to claims 1-7, 9-10, 15-17, 19-22, 27-28, 30-36, 42-44, 47-49, & 53-54 above, and further in view of Hatura et al., "hereinafter Hatura", (U.S Pat. 5,506,273).

Mesters discloses a catalyst as discussed above, except for the following differences.

Regarding claims 23 & 50, Mesters does not teach a support comprising fine-grained oxides and course-grained oxides. However, it would have been *prima facie obvious* to one of ordinary skill in the art at the time the invention was made to have utilized the same support in Mesters' catalyst in order to achieve a better catalyst in view of the advantage that the fine grained oxides give smaller catalyst particle size. It is also known in Hatura to use such metal oxide support material in any forms, such as powder spheres, granules, etc. to make a catalyst (see Hatura at col 3, ln 36-42). It is considered *prima facie obvious* to one of ordinary skill in the art that the metal oxide supports in any forms as disclosed by Hatura encompass the claimed course-grained oxides.

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Regarding claims 26 & 52, Ward does not disclose a catalyst containing zeolite. However, it would have been *prima facie obvious* to one of ordinary skill in the art at the time the invention was made to have incorporated zeolite into the catalyst of Mesters in order to strengthen the physical and mechanical properties of the catalyst, because it is known as a useful catalyst support material as evidenced by Hatura (see Hatura at col 3, ln 39-42).

9. Claims 25 & 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mesters et al., "hereinafter Mesters", (U.S Pat. 4,725,573), as applied to claims 1-7, 9-10, 15-17, 19-22, 27-28, 30-36, 42-44, 47-49, & 53-54 above, and in further view of Tsou et al., "hereinafter Tsou", (U.S Pat. 5,171,644).

Mesters discloses a catalyst as discussed above, except for the instantly claimed support containing carbon.

It would have been *prima facie obvious* to one of ordinary skill in the art at the time the invention was made to have utilized the instantly claimed carbon containing support in order to obtain an improved and better functional catalyst in Mesters, because it is known as a useful catalyst support as evidenced by Tsou (see Tsou at col 2, ln 42-43).

Claim Rejections - 35 USC § 102(b)/103

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 29 & 55 are rejected under 35 U.S.C. 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Mesters et al., "hereinafter Mesters", (U.S. Pat. 4,725,573).

Mesters discloses a catalyst as discussed above, except that the catalyst is not made by the same process as in applicants'.

Even though the catalyst is not made by the same process, the catalyst made is the same as applicants' catalyst. It has been held that "even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method or production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even the prior art product was made by a different process." See *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

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Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claims 90-100 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mesters et al., "hereinafter Mesters", (U.S. Pat. 4,725,573) in view of Ovshinsky et al., "hereinafter Ovshinsky", (U.S. Pat. 5,840,440).

Mesters discloses a catalyst containing metallic copper and nickel as active component carried on an inert refractory carrier, wherein the copper-nickel-alloy is present on the carrier in small metal particles with an average particle size of less than 14 nm (14 nm = 140 Å) (see col. 11, claim 1). Suitable inert refractory carriers include zirconium dioxide and titanium dioxide (see col. 2, ln 62- col. 3, ln 2). Mesters further discloses the nickel alloyed in the metallic copper is distributed so homogeneously, that it is present in copper-nickel particles containing at most 30% by weight of metallic nickel, based on the total weight of metallic copper and metallic nickel (see col. 3, ln 43-48).

Mesters discloses a catalyst, except for the nickel alloy comprising the instantly claimed metals. It would have been *prima facie obvious* to one of ordinary skill in the art at the time the invention was made to utilize a known TiNi type alloy containing modifier elements which may be selected from the group consisting of Ni, Cr, Co, Mn, Mo, Nb, Fe, Al, Mg, Cu, Sn, Ag, Zn,

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Pd, and mixtures or alloys thereof as taught by Ovshinky (see Ovshinky at col. 6, ln 43-48) to make a useful catalyst in view of the advantage that the hydrogen storage materials produced by using this TiNi type alloy containing these modifier elements comprising the crystallite size of less than about 200 Angstroms and more particularly less than about 100 Angstroms (see Ovshinsky at col. 6, ln 1-4), which applicants desired. Note that the claimed elements (Co, Mn, Fe, Al, Ti, and Sn) are met by the teaching of the reference because they fall within the listing of suitable modifier elements of the reference.

The instantly claimed metal particulate particle size is met by the teaching of the reference since the disclosed particle size range encompasses the claimed particle size range (see Mesters at col. 11, claim 1).

Response to Amendment/Arguments

14. Applicants' amendment/response filed on 7/1/03 has been fully considered, but not deemed persuasive in view of the new ground of rejections above and the following reasons.

First, applicants urged, that "the Mesters reference fails to teach or suggest a metal particulate having a particle size of less than about 70 Angstroms as recited in applicants' claim 1" (applicants' response page 13, last paragraph). This is noted but not found persuasive because Mesters clearly teaches the same catalyst having a particle size range of less than 140 A (see Mesters at col. 11, claim 1). Applicants claim a particle size of less than about 70 A, which falls within the disclosed particle size range of Mesters.

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Second, applicants urged, that “the Mesters reference fails to teach or suggest a nickel and/or nickel alloy particulate having a particle size of less than about 70 Angstroms as recited in applicants’ claim 30” (applicants’ response page 14, first paragraph). This is noted but not found persuasive because Mesters clearly teaches a catalyst containing nickel alloy and having the particle size range as described in the precedent paragraph.

Third, applicants’ urging regarding other references made in the rejections is also noted. It is considered the rejections made are proper because they teach the claimed subject matter; therefore, those rejections are maintained.

Last, it is considered the newly added rejection to “Mesters in view of Ovshinsky” is applicable to applicants’ newly added claims 90-100 because Mesters teaches a catalyst containing nickel alloy while Ovshinsky teaches the modifier elements including those of applicants claiming (which is Al, Co, Sn, Mn, Ti, and Fe) can be added to the nickel alloy to make a useful catalyst having a crystallite size of less than about 200 A and more preferably less than about 100 A (see Ovshinsky at col. 6, ln 1-4), which applicants desired. It is prima facie obvious to one of ordinary skill in the art at the time the invention was made to have incorporated such known modifier elements as suggested by the Ovshinsky reference to achieve an improved catalyst for the reason as discussed above.

It is the Examiners’ position to conclude the rejections as made are still proper, the rejections are therefore maintained.

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15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Conclusion

16. Claims 1-70 & 80-100 are pending. Claims 1-55 & 90-100 are rejected. Claims 56-70 & 80-89 remain withdrawn due to nonelected (distinct) inventions. No claims are allowed.


17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Cam Nguyen, whose telephone number is (703) 305-3923. The examiner can normally be reached on M-F from 8:30 am. to 6:00 pm, with alternative Monday off.

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The appropriate fax phone number for the organization where this application or proceeding is assigned is (703) 872-9310 (before finals) and (703) 872-9311 (after-final).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Nguyen/cnn *cnn*
September 22, 2003


Cam Nguyen
Patent Examiner
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